



**GESEL**  
Grupo de Estudos do Setor Elétrico  
UFRJ

20  
anos

## **The Bolivian Electricity Sector and perspectives for Integration with Brazil.**

Nivalde de Castro<sup>1</sup>  
Rubens Rosental<sup>2</sup>

The Bolivian electricity sector is going through some important and strategic transformations. The fundamentals for this process were established through the decision by the government to transform the ENDE into a public holdings company. This has enabled the company to assume a central role in driving energy policy, similar to other large organisations such as Eletrobras and the EDF (Eletrifique de France).

Since 2008-2009, following this strategic change, the Corporación ENDE and its technical experts have been developing the structure of an ambitious long term plan to increase the generation capacity of electricity by 12.000 MW. In addition, two complimentary objectives are being pursued: firstly, to meet growing short term demand for energy, by constructing new thermal energy plants, and secondly, transform Bolivia into a major energy exporter to its neighbouring countries, in particular the biggest electricity market, Brazil. In this sense, in coherence with the objectives of their energy policy and in order to improve institutional awareness of this strategic development program, the Ministry of Energy was created.

In relation to Brazil, the focus of this article, four questions merit particular attention. Firstly, the positive experience of the Bolivian-

---

<sup>1</sup> Professor do Instituto de Economia da Universidade Federal do Rio de Janeiro e coordenador do GESEL- Grupo de estudos do Setor Elétrico

<sup>2</sup> Professor e pesquisador do GESEL-UFRJ

Brazilian gas pipeline which has allowed for a secure and constant influx of currency. This of course has made a constructive contribution to the economic and social development of Bolivia. For Brazil, this has represented an important opportunity to diversify its energy mix, improving energy security. As a consequence, this has played a fundamental role in mitigating the 2012-2015 hydroelectric crises, and avoiding further 'black-outs'. Today Bolivia supplies 30% of Brazil's natural gas consumption.

Secondly, there exists a remarkable and special natural energy complementarity between the two countries: 94% of the Waters from all rivers in Bolivia flows into the Rio Madeira basin, which also represents the border between the two countries. Consequently, the construction of a hydroelectric plants in Bolivia, such as the Cachoreira Esperanca, El Bala and others will bring benefits to all the new hydroelectric plants planned in the ENDE program, with particular emphasis on the construction of the binational power plant in the vicinity of the city of Guajará Mirim.

The third question is related to the fact that electricity integration between the two countries has in fact already been initiated with the construction of the Santo Antonio and Jirau power plants on the Madeira river. These two plants required authorities to confront and overcome technological and environmental challenges which will be taken advantage of and improved by the construction of the other power plants. The most evident example of this is the binational power plant which is located upstream of Jirau.

The fourth point is related to the priority in Bolivia's energy policy to radically alter the composition of its electricity mix. Currently the thermal power plants represent 72% of the electricity mix, consuming natural gas which otherwise would be available for other internal and external markets. With the ENDE investment program, the goal has been set to invert the current mix in order to have hydroelectric energy represent 74% of the over all electricity mix by 2025. Bolivia to this day, has only taken advantage of approximately 1% of its hydroelectric potential, representing the lowest value among South American countries.

In light of all these technical and energetic questions which constitute this process of integration, a key point that needs to be taken under consideration, is to examine the economic and social benefits for Bolivia.

The most important and long term horizon goal, is the possibility of greater economic integration with Brazil, Latin Americas biggest economic Market. The export of electricity, an essential infrastructural input for Brazil, through 30 year contracts with predefined values, will be an important competitive advantage for Bolivia. This is also an advantage over natural gas for requiring continuous investments in prospecting, since the electricity linked to the ENDE Development Program is a renewable, clean and competitive resource, determining a structural differential for the Bolivian economy.

With the construction of new hydroelectric power plants, starting with the binational one, Bolivia's economy could benefit from the large volume of investments through job creation and the possibility of creating and expanding companies developing a productive chain in the national economy with positive implications on Sustainable economic growth.

On the other hand, the construction of the binational plant can be carried out within and subordinated to a regional sustainable development program, internalizing in the affected regions investments in education, health, agriculture and navigability of rivers, with the construction of locks. In this way, much of the mineral production and agrobusiness can be exported via the waterway that goes from Porto Velho to the Atlantic Ocean with more than 4,000 kilometres of extension.

In conclusion, the process of Bolivia's integration with Brazil, affirmed by plans of the Ministry of Energy and to be executed by ENDE, has the potential to generate positive and lasting impacts on Bolivia's economic and social development.